REMARKS

Claims 1, 4, and 8 have been amended to clarify the subject matter regarded as the invention. Claims 1-14 are pending.

Claims 1, 4, and 8 have been amended in a manner believed to overcome the rejections under 35 USC 112, second paragraph.

The Examiner has rejected claims 1-14 under 35 USC 103(a) as being unpatentable over Hershkowitz in view of Anumakonda and Zeng. The rejection is respectfully traversed.

With respect to claim 1, the above-captioned application discloses a start-up device for the POX reactor, which none of the cited references. As described in the application, an electrically heated catalyst (EHC) is used as the start-up device, which can initiate the reaction very quickly with minimum risk of explosion. Spark plugs may cause an explosion if the oxygen content becomes too high.

Applicants disclosed a EHC in the form of the metal monolith with both ends welded by electric wires. Thus, the EHC can have a noble metal catalyst washcoat. If the EHC is used without the catalyst washcoat, the partial oxidation catalyst has to be installed at the rear end of the EHC. In that case the desired shape of the catalyst is the monolith type recited in claim 1 to minimize the pressure drop. The catalyst claimed by Anumakonda is a simple noble metal washcoated on metal monolith which is different from ours in that we welded electric wires onto the catalyst-washcoated metal monolith which serves as both the start-up device and the partial oxidation catalyst.

In our invention, electricity supply to the EHC is terminated once the reaction starts, thereby saving electricity. The partial oxidation reaction proceeds after electricity is no longer being supplied. The use of metal monolith catalyst maintains the catalyst temperature higher than the ceramic counterpart in the absence of external energy supply due to its higher thermal conductivity. However, the reactor invented by Hershkowitz consumes electricity continuously to preheat the reactant which is different from supplying electricity during the start-up period "for igniting the partial oxidation reaction," as recited in claim 1. Continued supply of electricity, as taught by Hershkowitz, may lower the overall efficiency of the reactor.

When the reactants enter the reactor at room temperatures, the conversion of the reactants can not become complete due to lower reaction temperatures. Applicants disclosed employing a heat exchanger to increase the reaction temperature, which increases the reactant temperature by the hot product gas. In this way we can achieve high conversion without requiring continuous supply of electricity from an external source. The use of a heat exchanger in the partial oxidation reactor disclosed by applicants achieves high performance while only requiring electricity to be supplied during the short period of the start-up. The heat exchanger described by applicants is different from the way Zeng heats up the reactant. Zeng teaches using the hot reacting ceramic reactor itself to heat the cold reactant. In our case, the hot product gases heat the reactant gas via a heat exchanger.

In summary, claim 1 recites a fast start-up partial oxidation reactor which does not require external energy supply after the start-up period while achieving high performance, which differentiates claim 1 clearly from Hershkowitz, Zeng, and Anumakonda. Specifically, the cited references do not teach, either singly or in combination, "passing said feed gas mixture at the room temperature through a heat exchanger to be *preheated by the hot product gas stream before being introduced to the reactor*" and "*providing an electrically heated catalyst* installed in front of said catalyst structure comprising a supported noble metal catalyst washcoated on *a metal monolith having welded electrical rods at both ends* within said reactor *for igniting the partial oxidation reaction*," as recited in claim 1 (emphasis added). Claim 1 is therefore believed to be allowable.

Claims 2-14 depend from claim 1 and are believed to be allowable for the same reasons described above.

Reconsideration of the application and allowance of all claims are respectfully requested based on the preceding remarks. If at any time the Examiner believes that an interview would be helpful, please contact the undersigned.

Respectfully submitted,

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